

DisplayPort receiver

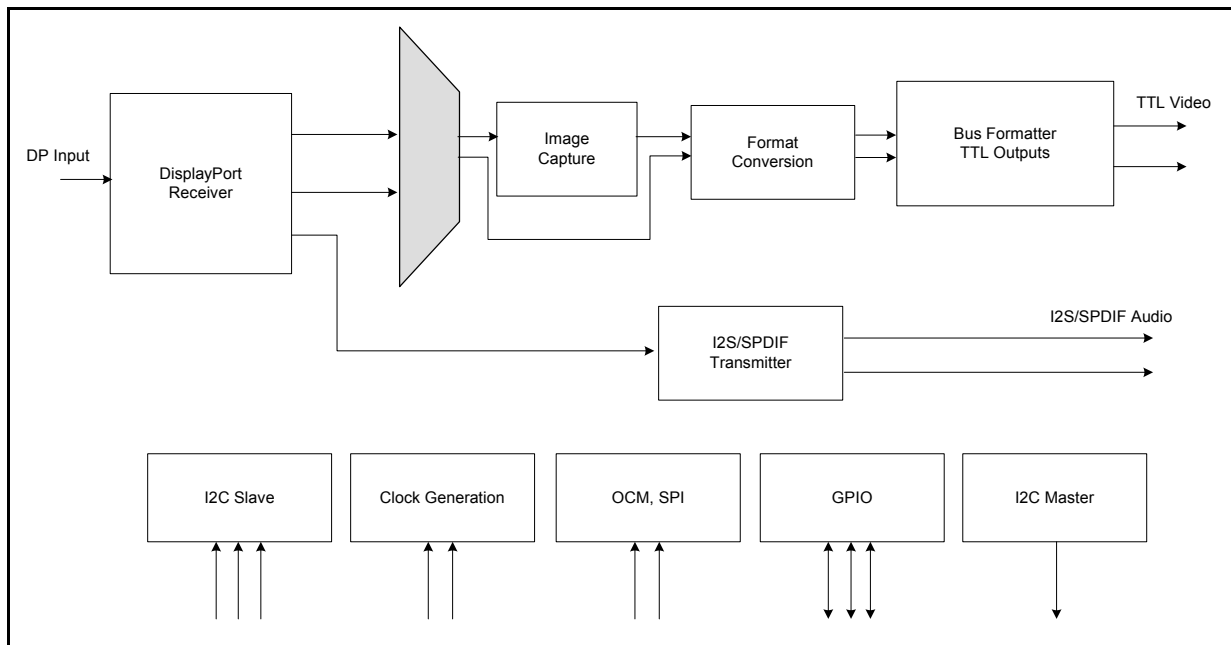
Data Brief

Features

- DisplayPort™ 1.1a compliant receiver
- HDCP 1.3 support
- DisplayPort link comprising four main lanes and one auxiliary channel
- Input bandwidth sufficient to receive AV streams up to WQXGA @ 60 Hz or Full HD@120 Hz, along with 24-bit audio streams @192 kHz
- 60-bit LVTTTL output configurable as single port or dual port with single pixel per clock or two pixels per clock
- RGB or YCbCr output color format
RGB / YCbCr 4:4:4 - 1x60, 1x48, 1x30, 1x24
YCbCr 4:2:2 - 1x24, 1x20, 1x16
- Color space conversion from RGB to YUV, and YUV to RGB
- I2S (8 channel) or SPDIF audio output ports compliant with IEC60958 and IEC61937 formats
- Two wire host interface
- General purpose inputs/outputs (Total of 25)
- Energy Spectrum Management® (ESM®)
- Package: 160-pin PQFP

Applications

- Interface for the digital reception of uncompressed audio-visual streams in TV and PC applications
- Applications that require high bandwidth and long reach cables, such as projectors



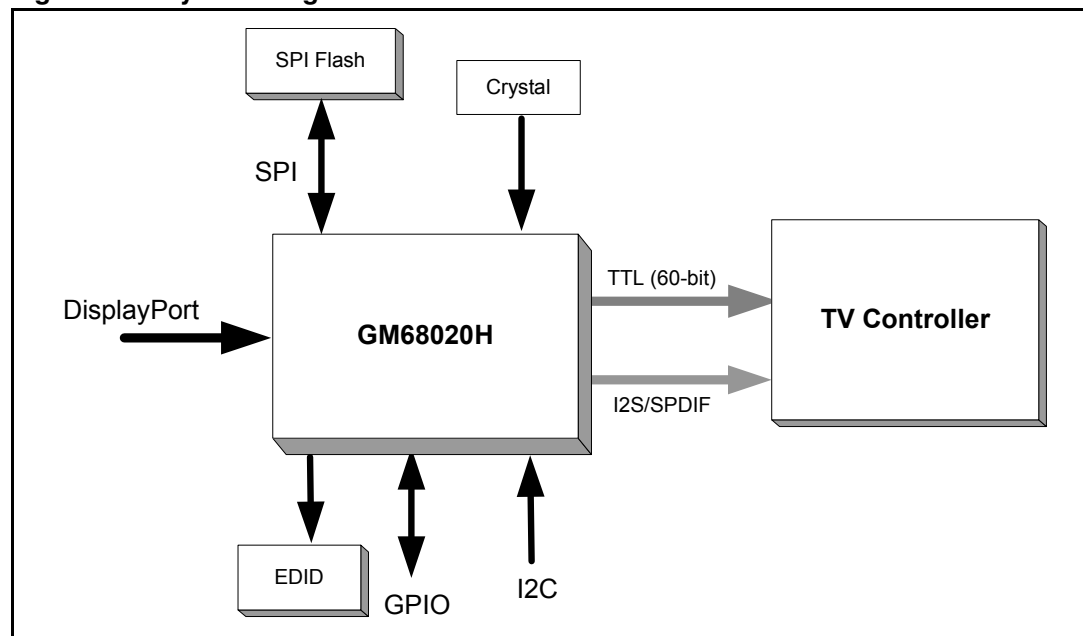
1 Description

The GM68020H is a DisplayPort receiver IC designed for the reception of secure, high-bandwidth, uncompressed digital audio-video signals for next-generation TV, projector, and PC display systems. It has a single link DisplayPort input comprising four main lanes and one auxiliary channel. The total available link bandwidth is 10.8 Gbps suitable for high resolution digital video content. The DisplayPort link bandwidth in GM68020H can support full HD video (1080p 30-bit color per pixel) @ 120 Hz or support 2560 x 1600 @ 60 Hz graphics along with corresponding audio streams. Unlike conventional display interfaces, DisplayPort link bandwidth can be freely traded between video resolution, refresh rate, and pixel bit depth. The auxiliary channel is a 1 Mbps bidirectional, half-duplex interface dedicated for link and device management.

The GM68020H supports RGB and YUV video color formats with a color depth of 12 (YUV 4:2:2 only), 10, and 8 bits. The GM68020H also supports both compressed and uncompressed audio formats. The 60-bit LVTTTL output ports on GM68020H can be mapped to receive video data streams either in two pixels per clock or single pixel per clock of chosen color depth. If the received data comprises audio streams, the extracted audio signal is sent out on the digital audio output bus. This device can support up to 8 channel LPCM audio, or a single wire SPDIF encoded audio. The GM68020H supports HDCP 1.3 content protection scheme for secure reception of digital audio-video content.

The GM68020H can be configured by an external Host through the I2C host interface. This IC also includes general purpose inputs/outputs that can be used for controlling system components. The GM68020H features color space converter (RGB to YUV, and YUV to RGB) and sample structure converter (4:4:4 to 4:2:2 and 4:2:2 to 4:4:4) for flexible interface with external video processing devices.

Figure 1. System diagram



2 Benefits

- Proven interoperability with all major DisplayPort vendors
- HDCP 1.3 support
- On-chip Microprocessor enables stand-alone operation for customized applications
- Flexible interface to ease system design – DP 1, 2, 4 lane configuration, 60/48/30/24 TTL port, YUV/RGB color format
- Low EMI
- Low power

3 Feature attributes

- DisplayPort 1.1a compliant receiver offering 10.8 Gbps bandwidth over 4 lanes
- 60-bit LVTTTL output configurable as single port or dual port with single pixel per clock or two pixels per clock
- RGB or YCbCr output color format:
 - RGB 444/YCbCr 444 with 60 or 48 bits using Display output Port A & B combined; with 30 or 24 bits using either Port A or Port B or both.
 - YCbCr 4:2:2 with 24, 20, or 16 bits using either Port A or Port B or both.
- I2S (8 channel) or SPDIF audio output ports compliant with IEC60958 and IEC61937 audio format
- Color space conversion from RGB to YUV or YUV to RGB
- Dithering support (10-bit to 8-bit)
- SPI interface with external Serial Flash for storing firmware, system configuration data
- Secured HDCP key storage using proprietary scheme
- General purpose inputs/outputs
- Two-wire I2C host interface
- UART interface
- Supports Energy Spectrum Management®
- 3.3V I/O, 1.8V Core
- 160-pin PQFP

4 Ordering information

Table 1. Order codes

Part number	Description
GM68020H	160-pin PQFP

5 Revision history

Table 2. Document revision history

Date	Revision	Changes
18-Nov-2008	1	Initial release.

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